
The Roadmap to Breastfeeding Success: Teaching Child Development to Extend Breastfeeding Duration

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ABSTRACT

Although medical literature establishes the benefits of, recommendations for, and variables impacting breastfeeding duration, the belief that her baby is not satisfied causes many women to abandon breastfeeding. Infant behaviors commonly misinterpreted as breastfeeding problems include increased crying, hard to calm, difficult to wake up, “restless” sleeping, frequent awakenings at night, or seemingly inattentive to or uninterested in his or her mother. *The Roadmap to Breastfeeding Success* is an evidence-based, clinical project that integrates best practices in lactation support with child development theory. Using family-friendly concepts and language, *The Roadmap to Breastfeeding Success* gives childbirth, lactation, and early parenting professionals background information and innovative resources to help mothers meet their breastfeeding goals, thus promoting the health and well-being of mothers, babies, families, and communities.

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The literature is abundantly clear: Breastfeeding is best for the baby, best for the mother, and best for the community. Research suggests that 60% of women do not meet their own breastfeeding goals (Odom, Li, Scanlon, Perrine, & Grummer-Strawn, 2013); consequently, they suffer disappointment and they and their babies suffer adverse health consequences. To respond effectively to this growing public health crisis, childbirth, lactation, and early parenting professionals must understand the variables that impact breastfeeding duration and acquire new skills and resources to improve breastfeeding outcomes.

Infants who are not breastfed face increased risks of pneumonia, gastroenteritis, otitis media, obesity,

diabetes, childhood leukemia, sudden infant death syndrome, and necrotizing enterocolitis (Horta, 2013; Ip et al., 2007). A recent longitudinal study also confirmed that breastfeeding for at least a year correlates with better mental health in children from birth through at least age 14 years (Oddy et al., 2009).

Women who breastfeed have lower risks for diabetes, cardiovascular disease, hypertension, hyperlipidemia, and rheumatoid arthritis as well as decreased breast and ovarian cancer (Horta, 2013; Ip et al., 2007). Breastfeeding benefits communities by decreasing both health-care costs (Bartick & Reinhold, 2010) and work time missed by mothers with breastfeeding babies (Eldelman & Schanler, 2012).

The World Health Organization (WHO, n.d.) recommends exclusive breastfeeding until 6 months and continued breastfeeding for 2 years. Although breastfeeding initiation is on the rise, the 2014 Centers for Disease Control and Prevention (CDC) Breastfeeding Report Card states that although 49% of infants in the United States are breastfeeding at 6 months, only 18% of American mothers are exclusively breastfeeding at 6 months (CDC, 2014). On average, only 39% of babies younger than 6 months of age in the developing world are exclusively breastfed (United Nations Children's Fund, n.d.). In the United States alone, the estimate is that 13 billion dollars a year are lost because of suboptimal breastfeeding, along with the deaths of a thousand infants (Bartick & Reinhold, 2010).

VARIABLES IMPACTING BREASTFEEDING DURATION

Research shows that the reasons women do not initiate or do not continue to breastfeed are multifactorial and include demographic, physical, social, and psychological issues (Thulier & Mercer, 2009). In addition to these issues, a woman's belief that her baby is not satisfied, whether or not there is evidence of insufficient milk, causes many women to abandon breastfeeding (Gatti, 2008; Heinig, Bañuelos, Goldbronn, & Kampp, 2009; Neifert & Bunik, 2013).

Although breastfeeding literature often suffers from inconsistent definitions and documentation of inadequate milk supply (Labbok & Starling, 2012), Gatti analyzed what it means when a breastfeeding mother believes her baby is "not satisfied" (Gatti, 2008). She concluded that a mother who believes her baby is not satisfied—even if the baby is adequately nourished—is likely to discontinue breastfeeding. Because only 3%–5% of mothers actually have a hormonal or anatomical problem that causes insufficient milk supply, it is likely that misperception of the baby's behavior—or mismanagement of breastfeeding problems—is the primary reason that 95% of mothers give up breastfeeding before they plan to do so (Neifert & Bunik, 2013).

The Infant Feeding and Practice Study II followed 1,300 breastfeeding women and documented why they weaned their baby and if their reasons

for stopping breastfeeding varied with the age of the child (Li, Fein, Chen, & Grummer-Strawn, 2008). Mothers identified "The baby was not satisfied" as a main reason for weaning at all ages of the babies' lives. Examples of behaviors that might cause a mother to believe her baby is not satisfied include increased crying, hard to calm, difficult to wake up to feed, "restless" sleeping, frequent awakenings at night, or seemingly inattentive to or uninterested in his or her mother.

INTEGRATING CHILD DEVELOPMENT THEORY WITH LACTATION SUPPORT

Dr. T. Berry Brazelton's classic work, *Touchpoints: Birth to Three: Your Child's Emotional and Behavioral Development* (Brazelton & Sparrow, 2006), and foundational work on temperament by Thomas and Chess (Thomas, Chess, & Birch, 1970) and Carey (1998), is especially pertinent to professionals who consider how a baby's behavior can confuse a breastfeeding mother and cause her to believe that her baby is unhappy or "not satisfied."

The concept, *Touchpoints*, refers to the moments in life when a child is poised to begin a significant developmental event. At such times of transition, children typically exhibit a sense of disorganization in their eating, sleeping, or general behavior. Brazelton's *Touchpoints* are predictable. Their timing correlates strikingly well with moments identified in *The Infant Feeding and Practice Study II* when women are apt to misinterpret their babies' behavior and thus, to abandon breastfeeding (Li et al., 2008). Work by Brazelton, and his colleagues, indicates that parental confidence is significantly increased when parents understand, are sensitive to, and respond appropriately to their baby's behavior (Nugent, Keefer, Minear, Johnson, & Blanchard, 2007).

Thomas and Chess, and later work by Carey, identified temperament characteristics that cause parents to view their child as "difficult." Such characteristics include a baby who is very active, is less predictable, has frequent state changes, or who exhibits little state regulation. Recent research has reaffirmed the insight that mothers whose child has a more challenging temperament are at higher risk of discontinuing breastfeeding (Mathews, Leerkes, Lovelady, & Labban, 2014). However, this same research also evaluated a woman's point of view about spoiling a baby and found that if the mother of a difficult baby believed it was not possible to spoil a young baby, then she would presumably use

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breastfeeding to comfort the baby and continue to breastfeed. On the other hand, a woman who had a baby with a difficult temperament and who worried about spoiling a baby by responding too quickly to his or her needs would be more likely to abandon breastfeeding. This research reminds lactation professionals that we need both to identify babies who are temperamentally more challenging and to clarify what their mothers believe about spoiling a baby (Mathews et al., 2014).

SYSTEMS ISSUES

A 2012 *Cochrane Reviews* article states that lactation support “only offered reactively, in which women are expected to initiate the contact, is unlikely to be effective” (Renfrew, McCormick, Wade, Quinn, & Dowswell, 2012, p. 1). This *Cochrane Reviews* article suggests, as others researchers do (Skouteris et al., 2014), that systems must be developed to provide proactive support and ongoing education about breastfeeding and child development during the weeks and months following birth.

The theory of planned behavior is a model that predicts a patient’s health-related behavior (Bai, Middlestadt, Peng, & Fly, 2010). This theory proposes that patients make positive health choices when they have a positive attitude toward the action suggested, when they understand that the action is socially normal, and when they have a feeling of control over the action required. *The Roadmap to Breastfeeding Success* is designed to help women make the choice to breastfeed, and to continue breastfeeding, by presenting pertinent information, by providing opportunities to see breastfeeding as normal, and by empowering mothers with support that is offered in a proactive and ongoing manner.

THE ROADMAP TO BREASTFEEDING SUCCESS: A SYSTEM FOR LACTATION SUPPORT

The Roadmap to Breastfeeding Success, a component of HUG Your Baby (Tedder, 2008), integrates current child development theory and research with best practices in lactation support. This program draws inspiration from health education literature that confirms both the effectiveness of e-learning for teaching patients and professionals and the importance of planning programs that address various learning styles (Gerdprasert, Pruksacheva, Panijpan, & Ruenwongsa, 2011; Inott & Kennedy, 2011; Paradis, Conn, Gewirtz, & Haltetman, 2011). *The Roadmap to Breastfeeding Success* program

systematically includes and integrates six elements for parents and professionals:

1. Twenty-minute parent education DVD
2. Parent education handout
3. Poster for display at health-care and parent education facilities
4. E-Newsletters for parents at each developmental “step” depicted on *The Roadmap to Breastfeeding Success*
5. *HUGs Around the World: International Lullabies to Calm Babies, Promote Breastfeeding and Empower Parents* (combining the musical styles and imagery of various cultures with important parenting and lactation content)
6. Online continuing education courses for professionals (Tedder, 2015b). A smartphone app is also in development.

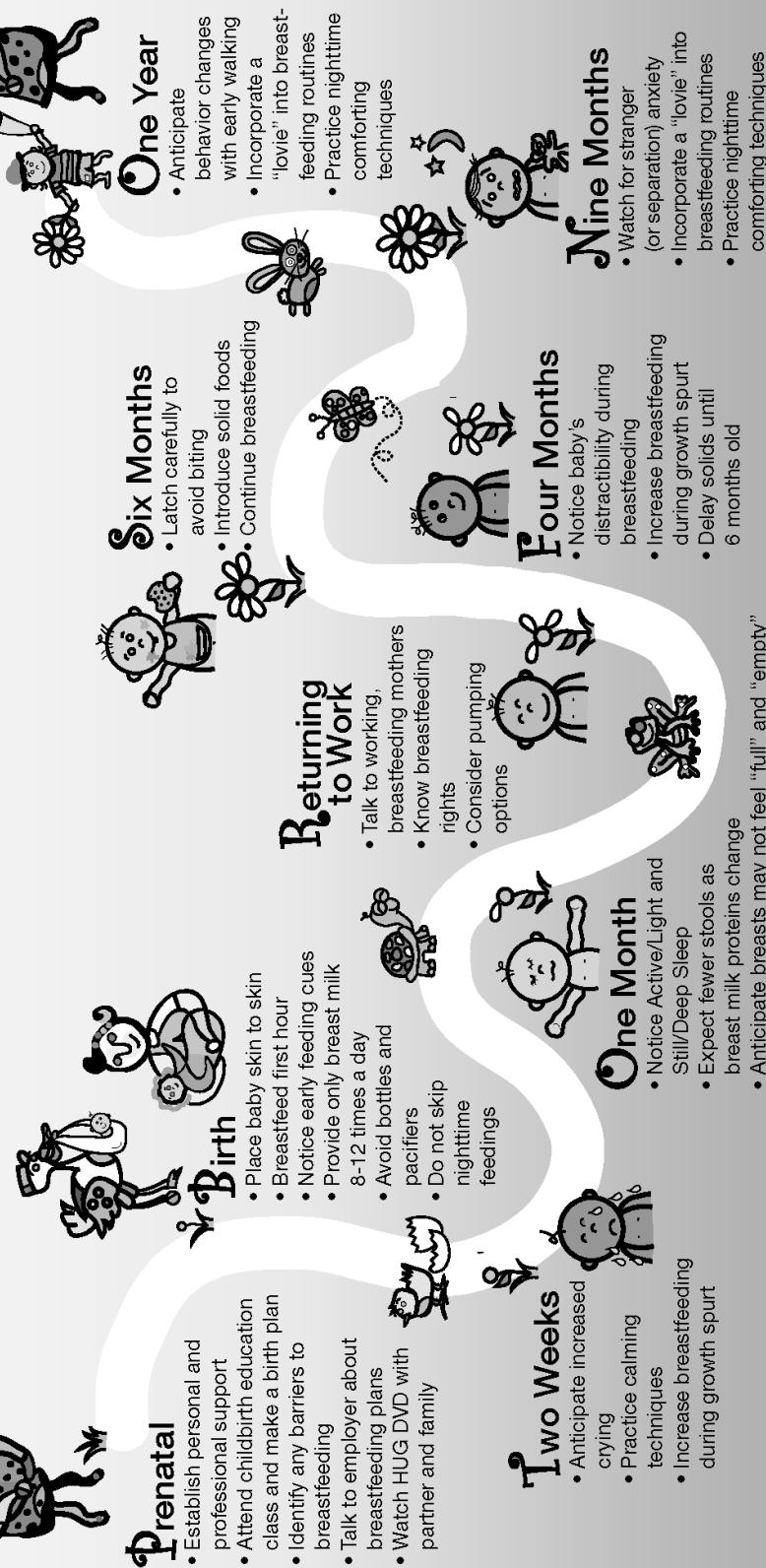
Building on research that demonstrates the effectiveness of video to educate parents (Paradis et al., 2011), the HUG parent education DVD (Tedder, 2015b) uses innovative, family-friendly language to help families recognize infant states (described as a newborn’s “resting, ready, and rebooting zones”; Tedder, 2008). The DVD also teaches parents how to understand a baby’s physiologic stress responses. It describes these as a baby’s “body SOSs—signs of overstimulation” including changes in a baby’s color, movement and breathing, and a baby’s “behavioral SOSs—‘spacing out,’ ‘switching off,’ and ‘shutting down’” (Tedder, 2008). In addition, the 20-minute DVD (available in seven languages) includes information about how to calm a baby, how to help a baby sleep and eat well, and how to play with a baby so that he or she can learn and grow.

The Roadmap to Breastfeeding Success handout and poster (available in full color and in six languages) offer an image of breastfeeding as a journey, a process that changes over time, and in relation to a baby’s age (Tedder, 2015b; Figure 1). Responding to parents’ desire for more information on child

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Roadmap to Breastfeeding Success

Developing your GPs – “Great Parenting Skills”



Discover HUG Roadmap to Breastfeeding Success E-Newsletter for more GPs Tips and Information
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Figure 1. The Roadmap to Breastfeeding Success handout.

development (Ateah, 2011), the reverse side of the handout includes additional details about normal development and breastfeeding during the first year of life.

The *Roadmap* E-Newsletter (sent at each developmental “step” until 1 year) provides information and support in a timely and family-friendly manner (Tedder, 2015a). Each E-Newsletter uses a case study format that is keyed to a child’s age. Links to video clips show the normal development of a baby—and parents’ reactions to these changes. The E-Newsletter includes age-appropriate breastfeeding facts as well as guidance about when and where to seek help for breastfeeding problems, should they arise.

Research confirms that lactation education for professionals extends breastfeeding duration in their patients (Feldman-Winter et al., 2010). Therefore, HUG Your Baby offers online courses, blogs, and monthly E-Newsletters for professionals that review pertinent medical, lactation, and child development literature (Tedder, 2015b).

THE ROADMAP TO BREASTFEEDING SUCCESS: STEPS ALONG THE WAY

Prenatal

Assuring that expectant women have access to personal and professional support and helping them establish their breastfeeding goals can be critical to promoting successful breastfeeding (Labbok, Taylor, & Parry, 2013). Current literature suggests that a woman’s prenatal intention to breastfeed increases her sensitivity to her infant’s cues, which in turn, increases both exclusive breastfeeding rates and breastfeeding duration (Tharner et al., 2012). In addition, hearing how childbirth choices and experiences may impact breastfeeding (Bergman & Bergman, 2013), and knowing the specific WHO recommendations, can also enhance breastfeeding initiation and duration (Wen, Simpson, Rissel, & Baur, 2012).

Learning about the importance of the Baby-Friendly Hospital Initiative (BFHI) Ten Steps (Abrams & Labbok, 2009), including referral to breastfeeding support groups (Step 10), is important to overcoming social barriers to breastfeeding. Women who know breastfeeding mothers or who observe breastfeeding role models through videos (and/or receive praise from their partners or their own mothers for breastfeeding) have significantly higher levels of confidence and commitment to breastfeeding than mothers who do not (Kingston, Dennis, Sword, 2007). Studies also show that mothers who

are highly confident about breastfeeding are more likely to be exclusively breastfeeding at 1 week and at 4 months postpartum (Blyth et al., 2009).

Appropriate peer support—and effective education—may minimize the negative impact of known demographic variables associated with low breastfeeding rates. Such variables include lower socioeconomic group; minority racial or ethnic status; single, less educated women; participation in a Women, Infant and Children’s program; and fear of breastfeeding in public (Stuebe & Bonuck, 2011; Thulier & Mercer, 2009; Waldrop, 2013).

Studies confirm that prenatal parents want more information about understanding and caring for their newborn (Ateah, 2011). The *Roadmap* “Prenatal” E-Newsletter provides information and illustrative video about how to read a baby’s body language. It also offers tips for discussing work options with an employer (if planning to return to work), affirms the partner’s potential role as a “breastfeeding coach,” and clarifies research on how breastmilk substitutes impact the infant’s developing gut (Walker, 2014). In addition, this E-Newsletter offers a link to the *Australian-Inspired HUGs Lullaby*, which celebrates a baby’s capacity to grow and thrive under his or her mother’s confident care (Tedder, 2015b).

Birth

Because only 289 hospitals and birthing centers in the United States have achieved the BFHI recognition (Baby-Friendly USA, n.d.), it is important to empower parents with information about all actions that promote exclusive breastfeeding. Because prolonged intervals between breastfeeding can have a deleterious effect on building milk supply, mothers need to know not to skip nighttime feedings during the first weeks of their baby’s life (Neifert & Bunik, 2013).

The “Birth” *Roadmap* E-Newsletter discusses the importance of kangaroo care (Augustin, Donovan, Lozano, Massucci, & Wohlgemuth, 2014), expected initial breastmilk volume, and signs of adequate milk supply. This E-Newsletter alerts mothers with planned cesarean surgeries or obesity about the possibility of delayed lactogenesis II and their options about donor milk and/or efforts to monitor and enhance milk production (Stuebe et al., 2014). It also encourages mothers to seek lactation help at the first sign of a physical challenge such as difficulty with latch, sore nipples, engorgement, mastitis, plugged ducts, or a baby with a possible tongue-tie. Professional help is especially important in light of

Kendall-Tackett's work that explains how pain increases the body's inflammatory process, causing neurohormonal changes associated with depression (Kendall-Tackett, 2010). She concludes that pain from cesarean surgery, or with breastfeeding, may contribute to postpartum depression, a condition associated with decreased breastfeeding duration.

Finally, the "Birth" E-Newsletter includes YouTube links that demonstrate proper positioning and latch, how to hand express, as well as a link to the *Japanese-Inspired HUGs Lullaby*, which celebrates attentive postpartum care that uses the baby's behavior to reassure new parents (Tedder, 2015b).

Two Weeks

Parents need to know that healthy, full-term babies often show a slight increase in crying that begins at about 2 weeks postdue date, peaks at about 6 weeks, and then gradually decreases over the next 6 weeks (Brazelton & Sparrow, 2006). Although the amount of crying may be mitigated by both parenting style and baby's temperament, all babies, on average, exhibit this crying pattern. Recent research suggests that a parent's confidence to soothe a fussy baby is more important than the amount of crying a baby may do (Radesky et al., 2013). Because studies show that mothers often resort to changing from breastfeeding to breastmilk substitutes in hopes of reducing crying (Kaley, Reid, & Flynn, 2012), parents need specific strategies to calm their baby.

The "Two Weeks" *Roadmap* E-Newsletter includes parameters to assess that breastfeeding is well established, shows a mother sharing her experience with the normal 2-week growth spurt, and discusses effective calming techniques. This E-Newsletter also provides a link to the *Korean-Inspired HUGs Lullaby*, which communicates effective strategies a father can use to calm his fussy baby (Tedder, 2015b).

One Month

Recognizing an infant's active/light and still/deep sleep cycles is critical to both breastfeeding duration and mother's rest. Unrealistic expectations about infant sleep, and disruptions in mother's sleep, interfere with breastfeeding and contribute to postpartum depression (Kendall-Tackett, 2014). Normal changes in infant stooling and breastfeeding sensations can also confuse mothers. Beginning as early as 1 month postpartum, changes in breastmilk composition cause fewer stools. Between 6 and 12 weeks postpartum, many women no longer experience

their breasts "filling" and "emptying," even when their supply is fine (Riordan & Wambach, 2009). A mother previously taught to watch for six stools a day and the filling and emptying of her breasts might worry that her milk supply is no longer adequate and therefore stop, or begin to supplement, breastfeeding.

The "One Month" *Roadmap* E-Newsletter includes information about safe sleep and about how understanding a baby's sleep cycles can enhance breastfeeding (once it is well established). This E-Newsletter also links readers to the *Hawaiian-Inspired HUGs Lullaby*, which reflects on the importance of distinguishing active/light sleep from still/deep sleep (Tedder, 2015b).

Returning to Work

Returning to work full time is associated with shorter breastfeeding duration compared to part-time workers or unemployed mothers (Mirkovic, Perrine, Scanlon, & Grummer-Strawn, 2014). Mothers returning to work need the support of other working breastfeeding mothers and need to be familiar with laws protecting lactating women. Inadequate maternity leave or inflexible work hours, lack of company facilities or policies that support breastfeeding, lack of privacy and time to pump, and fear of job loss if they take time to breastfeed or pump are all factors that contribute to decreased breastfeeding in working mothers (United States Department of Health and Human Services, 2011). However, mothers who return to work providing breastmilk to their babies actually miss less work than do working mothers who feed their babies breastmilk substitutes (Eldelman & Schanler, 2012). Supporting lactation at work decreases employee turnover, thereby lowering the cost of training new employees; it also reduces health-care costs and increases employee morale and productivity (United States Breastfeeding Committee, 2010).

The "Returning to Work" *Roadmap* E-Newsletter includes tips and resources for talking to employers, discusses pumping options, and contains links to two online videos: one that gives hand expression information and another that describes one woman's success in returning to work as a breastfeeding mother. It also contains current parent resources on working and breastfeeding (Mohrbacher, 2014).

Four Months

The "Four Months" step along the breastfeeding road focuses attention on a child's sudden surge in

cognitive development, which causes many babies to become increasingly curious about and interested in the world around them (Brazelton & Sparrow, 2006). A breastfeeding mother may experience her child's coming off the breast during a feeding and misinterpret this behavior as an effort to self-wean.

The "Four Months" *Roadmap* E-Newsletter references an article on postpartum depression and discusses the importance of delaying complementary foods ("solids") until 6 months (Duryea & Fleischer, n.d.). It also presents a video in which a breastfeeding mother first discusses her child's new interest in the world and then offers tips for responding to the sudden distractibility during breastfeeding that babies of this age typically demonstrate.

Six Months

Mothers need to know that the eruption of teeth does not necessitate discontinuation of breastfeeding and that an effective latch will prevent bites. Introducing complementary foods is more about exploring sensations, textures, and tastes than about meeting baby's nutritional needs.

The "Six Months" *Roadmap* E-Newsletter highlights signs that a baby is ready to begin solids and shares information about how to introduce complementary foods (Duryea & Fleischer, n.d.). It also discusses the preventive properties of breastfeeding for the development of children's teeth and provides a link to an online video of a mother giving tips for avoiding bites while breastfeeding.

Nine Months

Between 6 and 9 months of age, most babies exhibit stranger/separation anxiety, which typically peaks at about 9 months of age as babies are developing object permanence (Brazelton & Sparrow, 2006). Many babies this age (especially those with sensitive temperaments) awaken more often at night. A mother who thinks that this behavior indicates hunger might assume inadequate milk supply and add breastmilk substitutes. If her baby has been sleeping for an extended number of hours (or through the night) without additional breastfeeding, a mother may be assured that her baby does not now need more calories at night and that she can (if she wishes) practice techniques to calm a baby back to sleep without breastfeeding.

The "Nine Months" *Roadmap* E-Newsletter offers case studies of parents dealing with stranger/separation anxiety. It also includes information about

using a "lovie"—or "transitional object," in the language of child development specialists—and discusses how a teddy bear or soft blanket can comfort a baby back to sleep without resuming nighttime breastfeeding or adding breastmilk substitutes.

One Year

Universally, children wake up more at night when learning to walk (Brazelton & Sparrow, 2006). If parents expect this temporary wakefulness at night, then they will be less likely to misinterpret this normal change in behavior as a problem with breastfeeding. Walking does not mean it's time to wean!

The "One Year" *Roadmap* E-Newsletter reiterates the effectiveness of a lovie for comforting. It also suggests nighttime routines and techniques to prevent and solve frequent awakenings so that both baby and mother can get a better night's sleep.

RESEARCH COMPLETED AND UNDERWAY

Published research on *The Roadmap to Breastfeeding Success*, and other components of HUG Your Baby, has confirmed that viewing the parent education DVD enhanced parents' knowledge of newborn behavior (Kadivar & Mozafarina, 2013), that Japanese professionals judged the material to be pertinent to the families they serve (Shimpuku & Tedder, 2013), and that professionals who completed the program's online course gained new skills and knowledge and would recommend the course to colleagues (Tedder, 2012).

Other research, either completed or underway, examines use of HUG Your Baby programs with neonatal intensive care unit (NICU) fathers and with high-risk pregnant women, at-home visits, with birth center patients (in the United States and Japan), with nursing students, and with family physician residents (Tedder, 2014). Further research needs specifically to assess the extent to which *The Roadmap to Breastfeeding Success* program is effective in helping mothers meet their breastfeeding goals and in extending breastfeeding duration.

IMPLICATIONS FOR PRACTICE

Although childbirth, lactation, and early parenting professionals may not personally follow mothers

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through their entire breastfeeding journey, they are uniquely positioned to assure that young families have access to information, skills, and resources that will help them meet both WHO recommendations for breastfeeding duration and their own breastfeeding goals. In particular, these professionals should

- Help parents identify and problem solve around variables that might impact their breastfeeding (e.g., planned cesarean surgery or mother with obesity)
- Receive continuing education about developmental events (birth to 1 year) that can impact breastfeeding
- Refer to, or implement, systems of lactation support that include the following components:
 - Comprehensive prenatal childbirth and lactation education including teaching about newborn behavior
 - Baby-Friendly hospital and birth center maternity care
 - Access to adequately trained breastfeeding specialists (Bonuck et al., 2014)
 - Traditional lactation support coupled with contemporary information delivered by electronic technologies (e.g., social media, E-Newsletters, videos, apps; Giglia & Binns, 2014; Logan & Sangodele-Ayoka, 2014)
 - Ongoing, time-sensitive lactation information from the prenatal period through the first year of life (Renfrew et al., 2012; Skouteris et al., 2014).

Providing proactive, systematic, and ongoing breastfeeding support and education that addresses various learning styles will empower young families on their road to extending breastfeeding duration. Childbirth, lactation, and early parenting professionals who connect parents to successful programs of this sort can expect to enhance the health and well-being of the mothers, babies, families, and communities they serve.

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